

**ABSTRACT**

A magnetic memory fabricated on a semiconductor substrate is disclosed. The method and system include a plurality of magnetic tunneling junctions and a plurality of shields for magnetically shielding the plurality of magnetic tunneling junctions. Each of the plurality of magnetic tunneling junctions includes a first ferromagnetic layer, a second ferromagnetic layer and an insulating layer between the first ferromagnetic layer and the second ferromagnetic layer. At least a portion of the plurality of shields have a high moment and a high permeability and are conductive. The plurality of shields are electrically isolated from the plurality of magnetic tunneling junctions. The plurality of magnetic tunneling junctions are between the plurality of shields.